

SECTION 05210

STEEL JOISTS

PART 1 - GENERAL

1.1 QUALITY ASSURANCE

- A. Fabrication standards for joists and accessories: Steel Joist Institute "Standard Specification and Load Tables" for open web, long span and deep long span steel joists; American Institute of Steel Construction (AISC) "Specifications for Design, Fabrication and Erection of Structural Steel for Buildings," (referred to as AISC Specifications).
- B. Standard for welders and welding work: AWS "Standard Qualification Procedure".
- C. The Government reserves right to observe joists in manufacturer's shop during fabrication.
- D. The Government reserves right to observe and require testing of joists welded in place.
 - 1. Remove and replace work found not to comply with Contract requirements.
 - 2. Government will pay for removal and replacement of work found to be satisfactory.

1.2 SUBMITTALS

- A. Shop drawings:
 - 1. Show complete details including layout, special connections, bridging, jointing and accessories.
- B. Project information:
 - 1. Manufacturer's certification that steel joists comply with specified requirements.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle steel joists as recommended by SJI and AISC.
- B. Store joists clear of earth on platforms, skids or other supports.
- C. Provide anchor bolts and other items to be embedded in concrete masonry, with templates as required, in time for incorporation into work.

1.4 JOB CONDITIONS

- A. Do not overload joists. Note: Joists will not be able to carry design loads until deck is completely installed and fully connected.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel: Comply with SJI and AISC Specifications.
- B. Unfinished threaded fasteners: ASTM-A307, Grade-A, regular hexagon type, low carbon steel, with ANSI-B27.2, Type B, carbon steel washers.
- C. High-strength threaded fasteners: ASTM-A325 or ASTM-A490 as required, heavy hexagon structural bolts with nuts and hardened washers.
- D. Prime paint: Comply with SJI and AISC except that asphalt type paint is not acceptable.
 - 1. Shop coat of red lead or rust-inhibitive paint standard with manufacturer.
 - 2. Comply with SSPC-15.
- E. Bedding mortar:

1. Portland cement and sand, mixed at a ratio of 1 part cement to 3 parts sand, measured by volume, with only enough water for placement and hydration.
2. Shrinkage-resistant compound complying with Corp of Engineer's CRD-C588, Type M.

2.2 FABRICATION

- A. Fabricate in accord with SJI and AISC specifications and as follows:
 1. Do not splice principal tension members. Use only full length pieces.
 2. Make shop connections and splices using either arc or resistance welding. Do not shop bolt connections.
 3. Design and fabricate for maximum deflection of 1/360 of clear span under design live load.
 4. Shop holes, field holes, and enlargement of holes will not be permitted unless approved by the Government.
 5. Fabricate bearing ends to provide following minimum bearing unless otherwise indicated.
 - a. On masonry: 4 IN, minimum.
 - b. On steel: 2-1/2 IN, minimum.
- B. Design joists for uplift loading as indicated on drawings.
- C. Where special or concentrated loads are indicated, reinforce joist and develop details as necessary for support.
- D. Provide extended bottom chords where indicated. Comply with SJI and AISC requirements and load tables.
- E. Provide extended top chords where indicated. Comply with SJI and AISC requirements and load tables.
- F. Provide ceiling extensions in areas having ceilings attached directly to joist bottom chord.
 1. Provide either an extended bottom chord or a separate unit of sufficient strength to support ceiling construction.
 2. Extend ends to within 1/2 IN of wall surface.
- G. Remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories.
- H. Apply one shop coat of steel joist primer paint to steel joists and accessories, by spray, dipping, or other method to provide continuous dry paint film thickness of not less than 0.50 mil.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine areas and conditions under which steel joists are to be installed for conditions detrimental to proper and timely completion of work.
- B. Do not proceed with work until unsatisfactory conditions have been corrected.
- C. Do not start placement of steel joists until supporting work is in place and secured.

3.2 ERECTION

- A. Do not install joists damaged so that strength is impaired.
- B. Where not specifically indicated otherwise, place and secure steel joists in accord with SJI and AISC "Specifications" and as herein specified.
- C. Field weld joists to supporting steel framework in accord with SJI and AISC - Specifications for type of joists used. Coordinate welding sequence and procedure with placing of joists.

- D. Secure joists resting on masonry or concrete bearing surfaces by bedding in mortar and anchoring to masonry or concrete construction as specified in SJI and AISC Specifications for type of steel joist used.
- E. Place joists on supporting work, adjust and align in accurate location and spacing before permanently fastening.
 - 1. Provide end bearing and anchorages to secure joists to supporting members or walls in accord with SJI and AISC Specifications, unless otherwise indicated.
 - 2. When joists do not bear flush on supporting member or wall, take corrective measures to ensure full bearing, as directed by the Government.
- F. Provide bridging in accord with SJI and AISC Specifications, where not specifically indicated otherwise, except as modified herein.
 - 1. Provide horizontal or diagonal type bridging as indicated.
 - 2. Provide additional bridging at each line between exterior and first interior joist and then at every 12th joist space.
 - 3. Do not use sag rods as substitute for bridging.
- G. Completely install bridging immediately after erection, before loads are applied.
 - 1. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.
 - 2. Provide bridging connections at top and bottom chords capable of safely resisting a force of 500, 1000 and 1500 LB for open web, long span and deep long span joists respectively.
- H. Remove or repair damaged joists or other work, to satisfaction of the Government.
- I. After installation, paint field bolt heads and nuts, welds and abraded or rusty surfaces on joists and steel supporting members.
 - 1. Wire brush surfaces and clean with solvent before painting.
 - 2. Use same type of paint as used for shop painting.

END OF SECTION